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ABSTRACT

The efficiency of the theoretical planning model FACT for modifying the teaching behavior of elementary school interns is evaluated. Results indicate that FACT may be useful in this regard, and thus may bridge the gap between the instruction received in teacher colleges and the teaching of the graduates. (MS)

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An Attempt to Modify the Teaching Behavior of Elementary School Interns through the use of a Theoretical Planning Model

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One of the major challenges confronting educational researchers is to create a scheme for modifying the teaching behavior of teachers and/or interns. Popham (1971) recently summarized the results of a series of investigations which suggest that experienced teachers may not be significantly more proficient than "people off the street," in bringing about desired behavior changes in learners. As Brown and Vickery (1967) indicate, one doesn't need to be an expert to detect the gap between what teacher colleges preach and what or how their graduates teach. In general, teachers are of the opinion that what goes on in teacher education programs is good, but theoretical in nature, while their needs to function in the classroom must be dealt with in a practical

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manner. It becomes apparent, due to the nature of the task and persons involved, that any scheme developed to modify teaching behavior must be scientifically sound, comprehensible, practical, and efficient to implement.

PROBLEM

The present study was designed to evaluate the efficiency of a theoretical planning model FACT (Functional Analysis of Classroom Tasks), in modifying the teaching behavior of elementary school interns.

FACT, (Ober and Uprichard, 1970) is designed explicitly to identify, examine, classify, and/or quantify the instructional stimuli that are available to the learner in a given teaching/learning situation. The categories of the system originate from the synthesis of two components: a sensory component and a cognitional component. Each of these two components is characterized by its own unique structure. The sensory component is divided into three exclusive subcomponents - Visual (V), Auditory (A), and Tactile (T).* The cognitional component

*In a later revision of the FACT system the sensory component is partitioned into five exclusive subcomponents - Visual, Auditory, Tactile, Smell, and Taste.

is also divided into three subcomponents - Concrete (C), Representative (R) and Abstract (A). Almost all instructional stimuli occurring in the classroom can be categorized systematically into one of the nine categories that are formed by the mathematical pairing of these six subcomponents as shown in the matrix in Figure 1.

		Cognitional		
		Concrete	Representative	Abstract
Sensory	Visual	VC[1]	VR[2]	VA[3]
	Auditory	AC[4]	AR[5]	AA[6]
	Tactile	TC[7]	TR[8]	TA[9]

Figure 1. Category Classifications for Instructional Stimuli

To facilitate a better understanding of the categories, a description of each is given in Figure 2. It is intended that the categories described are mutually exclusive. That is, no given stimulus could be categorized in more than one category at a given time. For example, if a teacher touches a real object around which the instruction is centered and does not pass it to the children so they touch it, the stimulus is not recorded as Tactile Concrete, but only Visual Concrete. Only the stimuli that affects the children are considered.

Category Numeral — Description of Behavior

1. VISUAL CONCRETE: Viewing the real or actual object or thing around which the instruction is centered.

2. VISUAL REPRESENTATIVE: Viewing a model (two dimensional or three dimensional) or diagram representing an object, thing, or idea around which the instruction is centered.

3. VISUAL ABSTRACT: Reading a written description of something related to the object, thing, or idea around which the instruction is centered.

4. AUDITORY CONCRETE: Hearing the real or actual object or thing around which the instruction is centered.

5. AUDITORY REPRESENTATIVE: Hearing a representation of the object, thing, or idea around which the instruction is centered.

6. AUDITORY ABSTRACT: Hearing a verbal description of something related to the object, thing, or idea around which the instruction is centered.

7. TACTILE CONCRETE: Feeling (physically) the real or actual object or thing around which the instruction is centered.

8. TACTILE REPRESENTATIVE: Feeling (physically) a representation of an object, thing, or idea around which the instruction is centered.

9. TACTILE ABSTRACT: Feeling (physically) and/or kinesthetically something related to the object, thing, or idea around which the instruction is centered.

Figure 2. Category Descriptions - FACT.

As a planning model, FACT can be used as a means for selecting and organizing the stimuli (i.e., materials, aids, etc.) that are to be presented in the instructional phase of a lesson. It essentially provides the teacher or intern with a systematic process for generating a variety of instructional stimuli in order to accommodate individual student interests, aptitude, and "learning styles." Theoretically, the FACT system can be employed effectively in any content area and at any level of sophistication providing that the user is aware of the specific objectives that are set forth in a particular instructional/learning situation. (This gives rise to the acronym FACT - Functional Analysis of Classroom Tasks.)

When used as an observational system, FACT is useful in research activities as a data collection device as well as a means for providing the teacher with meaningful feedback describing his own classroom behavior. Thus, the system can assist the teacher in planning a lesson, and, in turn provide him with "objective" evidence describing his performance.

PROCEDURE

The elementary interns participating in this study were enrolled in the Continuous Laboratory Experience Program, College of Education, University of South Florida. This program is

unique in that emphasis is on continuous involvement with children over a period of five quarters. At the beginning of the junior year each teacher candidate is placed on an intern team which is assigned to work with a group of professors in a local public school at least two hours daily. The intern team remains in tact for all five quarters, but the professors may vary from quarter to quarter.

The two intern teams selected for this study were in their third quarter of continuous experience at schools having the same organizational structure (pods) and attended by middle class pupils residing in northwest Tampa, Florida. The course background and teaching experiences of the two teams were similar. From each team of approximately twenty-five interns at a given school, fourteen were randomly selected (N=28). One group of fourteen was blocked on a primary/intermediate variable (seven primary, seven intermediate) and assigned to an experiemental treatment. The remaining fourteen interns were blocked in a similar fashion and assigned to a control treatment. Both groups of interns had their teaching experiences in the morning.

The independent variable in this study was directly related to the FACT planning model. Subjects in the experimental and control groups were enrolled in separate sections of a general four hour elementary methods course. Each group received instruction from their major advisor who works with them for the five quarter experience. The two advisors held Ed.D.'s, were approximately the same age, and in their first year of college teaching. The experimental treatment comprised two hours of instruction at the beginning of the quarter; one hour to present and discuss the theoretical implications of FACT and a second hour trying to bridge the gap between the theoretical implications and practical uses of the model for teaching. The experimental treatment was brief, but practical in terms of time allotment in a general methods course. Also, the experiemtnal group was encouraged to use the FACT model in planning their instructional lessons. The instruction received by the control group was approximately the same as that of the experimental except for the two hour treatment described above.

The dependent variable was the number of different stimuli used by an intern in a given teaching segment. Three, twenty-five minute segments spaced at three week intervals were video

taped of each intern. The video tapes were evaluated separately by three observers employing FACT. Prior to viewing the actual video tapes, the observers spent three hours learning and fully understanding FACT. All observers were in full agreement, as to the criteria needed for a specific stimuli to be categorized in a certain area. If there were differences with respect to an intern's score, the tape was reevaluated by the observers as a group and differences resolved. No feedback was given to any intern after his or her tape segment was evaluated regarding the number of stimuli used.

Some caution should be noted. Because of the number of confounding variables in this study, it should be considered quasi-experimental and/or exploratory in nature. For example, there is no reliability data on observers due to the newness of FACT, some video taped segments varied from one content area to another, and the two schools used were assumed to be similar.

Analysis and Results

A two (experimental/control) X two (primary/intermediate) X three (observations) analysis of variance with repeated measures on the third factor was used to analyze the data. The analysis

yielded two significant F's: Within subjects a triple interaction effect ($\alpha = .05$), and Between subjects a main effects difference between experimental and control groups ($\alpha = .01$). An omega squared index (ω^2) computed for main effects between experimental and control indicated that 37% of the variance in the dependent variable was accounted for by the independent variable. See Table 1 and 2 for a summary of the analysis.

Although the experimental treatment had a statistically significant effect over three observations, there was not statistical significance between observations. That is, the interns in the experimental group did not significantly increase the number of different stimuli used from one observation to another. Grade level did not have an effect upon the performance of the interns with respect to the dependent variable.

A descriptive analysis of the data revealed some interesting findings. The experimental group, over three observations, used more stimuli than the control group in the categories Visual Representative (VR), Visual Abstract (VA), Tactile Concrete (TC), Tactile Representative (TR); less stimuli in category Auditory Representative (AR), and the same number of stimuli in categories Visual Concrete (VC) and Auditory

TABLE 1

THREE FACTOR ANALYSIS OF VARIANCE WITH REPEATED MEASURES ON NUMBER OF STIMULI OBSERVED PER TEACHING SEGMENT

SOURCE	SS	df	MS	F
Between Subjects	46.91	27		
A (experimenta../control)	19.04	1	19.04	16.55**
B (primary/intermediate)	.19	1	.19	.18
AB	.06	1	.06	0
Subjects within groups (error between)	27.62	24	1.15	0
Within Subjects	39.33	56		
C (observations)	1.14	2	.57	.92
AC	2.20	2	1.10	1.77
BC	1.48	2	.74	1.19
ABC	4.70	2	2.35	3.79*
C X Subject within groups (error within)	29.81	48	.62	

** P < .01
* P < .05

$$\text{Est. } \omega^2_a = \frac{SS_{col.} - (C-1)\,MS_e}{MS_e + SS_{TOT.}} = \frac{19.04 - 1.15}{1.15 + 46.91} = .37$$

TABLE 2

NUMBER OF STIMULI USED PER GROUP PER OBSERVATION

		Experimental			Control		
	Observations:	I	II	III	I	II	III
Primary	Subjects						
	1	2	3	4	2	4	1
	2	4	4	4	2	2	3
	3	3	2	4	2	1	2
	4	1	3	3	3	1	2
	5	1	4	3	3	2	1
	6	3	3	3	3	2	2
	7	2	3	4	2	2	2
	Subtotal:	16	22	25	17	14	13
	Mean:	2.29	3.14	3.57	2.43	2.00	1.86
Intermediate	8	2	2	3	2	1	2
	9	5	3	3	4	4	4
	10	4	4	4	1	2	1
	11	4	2	2	2	3	2
	12	3	3	4	2	1	3
	13	4	3	3	3	2	2
	14	2	2	4	1	1	2
	Subtotal:	24	19	23	15	14	16
	Mean:	3.43	2.71	3.29	2.14	2.00	2.29
	Total:	40	41	48	32	28	29
	Mean:	2.86	2.93	3.43	2.29	2.00	2.07

Abstract (AA.) Neither group used any stimuli in two categories: Auditory Concrete (AC) and Tactile Abstract (TA) (See Table III). Of the total number of stimuli used the experimental group, approximately 33% was AA and 27% VA. The figures for the control group were 47% AA and 27% VA (See Table IV).

Conclusion

The data seems to support the conclusion that FACT is a useful tool in modifying the teaching behavior of elementary school interns and thus may have the potential to bridge the gap between what teacher colleges preach and how their graduates teach.

The findings obtained herein reflect the results of the experimental conditions and the characteristics of the sample employed. Further, the study provides no data on the relationship between the number of stimuli used in a teaching segment and achievement of learners.

TABLE III

TYPES OF STIMULI USED PER GROUP PER OBSERVATION

	Experimental				Control			
Observations:	I	II	III	Total	I	II	III	Total
Stimuli								
1. VC	4	1	0	5	2	2	1	5
2. VR	5	5	11	21	3	2	1	6
3. VA	9	13	13	35	9	4	11	24
4. AC	0	0	0	0	0	0	0	0
5. AR	0	1	0	1	1	4	0	5
6. AA	14	14	14	42	14	14	14	42
7. TC	6	7	9	22	3	2	2	7
8. TR	2	0	1	3	0	0	0	0
9. TA	—	—	—	—	—	—	—	—
TOTAL	40	41	48	129	32	28	29	89

TABLE IV

PERCENT OF STIMULI USED PER GROUP OVER THREE OBSERVATIONS

Stimuli	Experimental	Control
1. VC	.04	.06
2. VR	.16	.06
3. VA	.27	.27
4. AC	.00	.00
5. AR	.01	.06
6. AA	.33	.47
7. TC	.17	.08
8. TR	.02	.00
9. TA	—	—
	100	100

B I B L I O G R A P H Y

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